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Davis
2121C Second Street
Davis, CA 95616

# BIOLOGICAL/INSECTICIDE DOSE-RESPONSE DATA COLLECTED FOR FSCBG AND GYPSES SPRAY ADVISOR MODELS

FHTET 96-22
December 1996

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Pesticides used ... , animals, and plants. Follow the directions and heed all pre... ...bels. Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides where there is danger of drift when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment, if specified on the label.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

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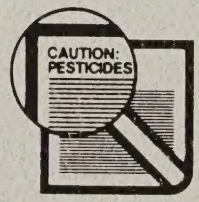
**NOTE:** Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S Environmental Protection Agency, consult your local forest pathologist, county agriculture agent, or State extension specialist to be sure the intended use is still registered.




Cover Photo
Pandora moth (Coloradia pandora)
on ponderosa pine, Jacob's Lake, AZ.
October 1982, photo by John Barry

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# Biological/Insecticide Dose-Response Data Collected For FSCBG and GypsES Spray Advisor Models

Prepared by:

Milton E. Teske
Alina Z. MacNichol

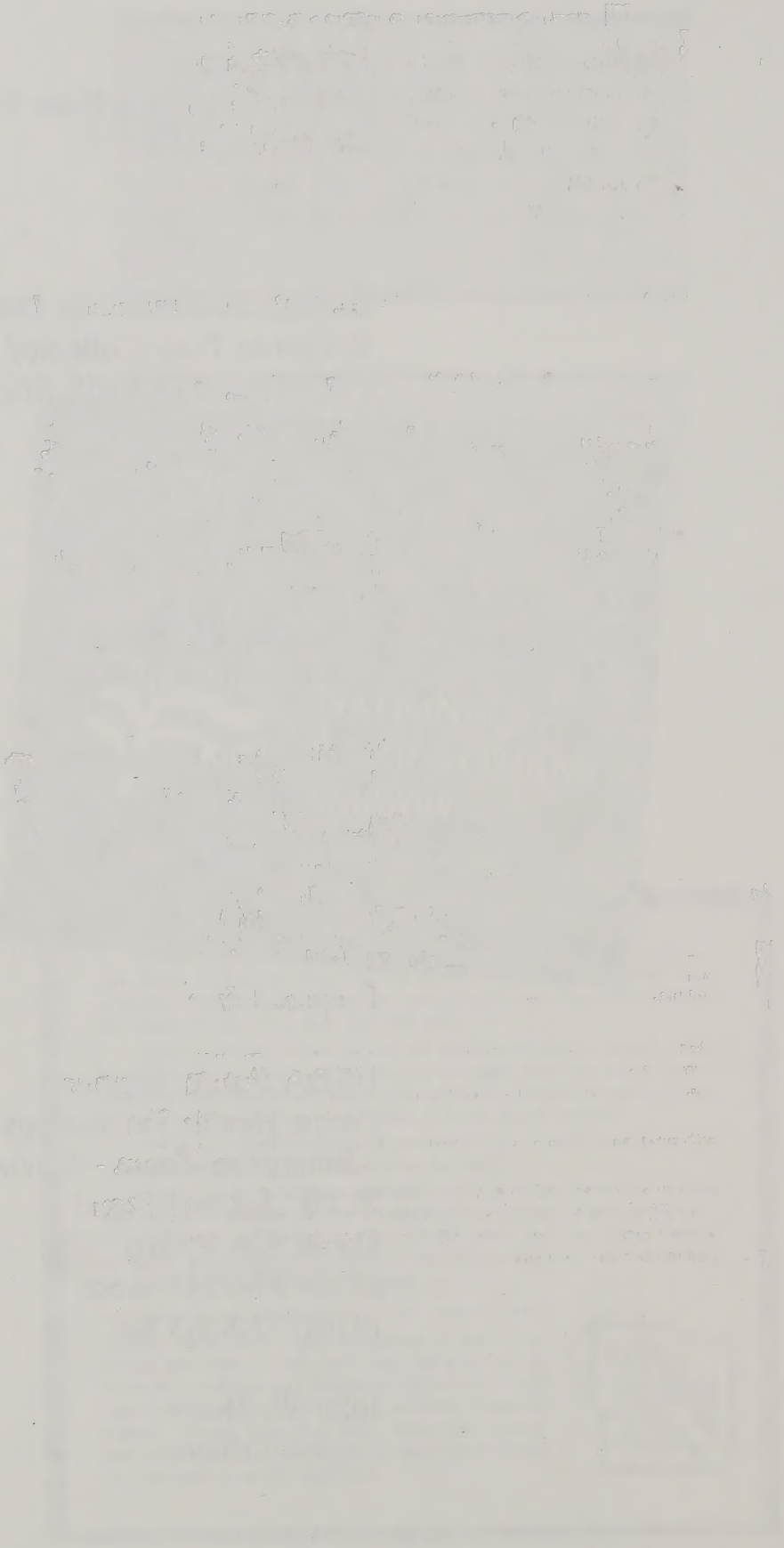
Continuum Dynamics, Inc.
P.O. Box 3073
Princeton, NJ 08543

Contract No. 53-0343-4-00009

Prepared for:

USDA Forest Service
Forest Health Technology
Enterprise Team - Davis
2121C Second Street
Davis, CA 95616
(916)757-8341 voice
(916)757-8383 fax

John W. Barry
Project Officer



# Preface

This biological/insecticide response database represents a noted milestone in the development of a model that predicts pest control efficacy, efficiency and the impact of pest control agents on non-target organisms. With this capability, land resource managers can evaluate and plan field operations that have a high assurance of meeting project objectives, including mitigating environmental impact. These dose-response models will be connected to the pest control agent spray drift and dispersion models, specifically through the Forest Service Cramer-Barry-Grim (FSCBG) aerial spray prediction model and its related decision support systems.

It is significant that over a short period of 20 years a model capability has been developed that assembles the essential elements of engineering and physics, and provides a capability of predicting the trajectory and fate of droplets being atomized from each nozzle on any specified spray system. The development of FSCBG was indeed a significant accomplishment, but we still needed to make a connection to predicting biological and insecticide results to address the needs of biologists and toxicologists. This need was recognized since the beginning of FSCBG development in the 1970s; however, we initially focused on the significant challenge of developing the spray predictive model itself. Now, with model development nearly completed, we are able to focus on the biological and insecticide aspects. The database described herein provides an enhanced capability for users of FSCBG, SpraySafe Manager, GypsES Spray Advisor, and other decision support systems that will follow.

We are fortunate to have the services of Continuum Dynamics, Inc. (CDI) of Princeton, New Jersey, to collect the database listed in this document and include it in FSCBG version 5.0 and the above-mentioned decision support systems. The database will allow users worldwide to use FSCBG and its decision support systems to answer "what if" questions from the viewpoint of environmental safety, target control, and cost/benefit and regulatory needs.

I also asked CDI to include all dose-response data that they might find in the literature, recognizing that: (1) there is no scientific distinction between forestry and agricultural use of pesticides; (2) some pesticides no longer registered in the United States are still registered in other countries; (3) researchers might want to reconstruct and study past events; (4) some of the discontinued pesticides might have similar properties to newer agents that have a limited dose-response dataset; and (5) the literature has no conformity and often Latin names are not provided.

We invite your comments and input to this database and processes as you apply it to your specific and varied needs.

John W. Barry
Davis, CA
November 1996

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# 1. Background

This document contains a detailed summary of all available biological and insecticide dose-response data, collected from John Ghent, Amy Onken, John Barry and Parshall Bush, from USDA Forest Service reports, project reports, laboratory studies, technical journal articles, and other available sources. These data form the current state of knowledge of insect response to pesticides and plant response to herbicides.

Over the last twenty-five years the USDA Forest Service has been pursuing the development of computer models to predict the dispersion and deposition of aerially released material. The two current models available are AGDISP (Bilanin et al. 1989) and FSCBG (Teske et al. 1993). FSCBG (for Forest Service Cramer-Barry-Grim) predicts the transport and behavior of pesticide sprays released from aircraft, influenced by the aircraft wake and local atmospheric conditions, through downwind drift and deposition to total accountancy and environmental fate. The AGDISP (for AGricultural DISPersal) near-wake model, contained within FSCBG, solves a Lagrangian system of equations for the position and position variance of spray material released from each nozzle on the aircraft. The combination of AGDISP within FSCBG presents a powerful predictive tool for dispersal of spray material from multiple line sources, including evaporation, canopy penetration, and accountancy and environmental fate.

To date, these and other models do not contain the capability to predict the response of biological organisms to the pest control agent. To that end, this document collects all available data, parameterizes the data that contain sufficient information (two data points), and establishes a library of dose-response coefficients for use within FSCBG and the decision support systems for which FSCBG is the computational engine. These decision support systems include SpraySafe Manager and GypsES Spray Advisor. These are briefly summarized as follows:

SpraySafe Manager. In an effort to simplify the input requirements to FSCBG for herbicide applications, Richardson (1995) suggested the development of a separate, highly user-friendly personal computer program (called SpraySafe Manager). One of the important components of this program will be a dose-response library, containing herbicide/plant combinations important to New Zealand. Herbicides provide a valuable vegetation management tool for forest managers; however, off-target spray deposition and drift have become significant environmental concerns. It is essential that herbicides be applied in a responsible manner with a clear understanding of how the selected application methods mitigate potential environmental impact and influence efficacy and operational efficiency. Of particular concern, until recently, was the lack of tools to assist managers to define best aerial application practices, and to demonstrate to clients, regulators, and the public that they are using these practices. FSCBG now provides a reliable method for planning safe aerial applications and calculating the environmental fate of pesticides from the point of spray release to deposition, and of defining dimensions of buffer zones. Assessing risk to a sensitive organism, and calculating buffer zone dimensions, require not only a prediction of the level of exposure but also knowledge of the biological response of the organism to the specified herbicide dose. SpraySafe Manager (SSM), a collaborative development of the New Zealand Forest Research Institute (FRI) and the USDA Forest Service, has addressed these problems by integrating FSCBG with models of plant response to herbicide application. With a simple, user-friendly interface, SSM allows users to calculate buffer distances based upon biological response data, and to rapidly determine biological and economic consequences of any application spray scenario.

GypsES Spray Advisor. For the last five years a focused effort has been undertaken by the USDA Forest Service in the development and refinement of a decision support system for gypsy moth management. This system, called GypsES, contains mapping capabilities, database management, a forest stand damage prediction model, and FSCBG for the prediction of deposit and drift effects from gypsy moth spray projects (in its Spray Advisor module). GypsES is being developed by the USDA Forest Service, Northeastern Forest Experiment Station and State & Private Forestry represented by the Northeastern Area, Region 8 and Washington Office Forest Health Technology Enterprise Team - Davis. GypsES provides treatment support by predicting insecticide spray drift and deposit with FSCBG, and providing data on post-control of spray deposit and effectiveness of treatment. GypsES uses its GIS system to handle all geographic data, a spatially-referenced database, and a full-featured map creation and editing facility using topographic or SPOT imagery backgrounds. The basic objectives of GypsES are to model the sequence of evaluations necessary for gypsy moth management decisions and to provide managers with useful tools to make their work easier and more efficient.

Previous work by Richardson, Ray and Vanner (1993) demonstrated that the distribution of spray block deposits may be closely approximated by a normal distribution following a logarithmic transformation of the deposition. The important parameters are the mean of the deposition in the spray block (where spray lines are separated by swath width) and coefficient of variation (CV), which represents the standard deviation of the normal distribution. Both mean deposition and CV are computed by FSCBG.

Dose-response is generated by fitting field or laboratory data to a symmetrical sigmoid curve (following Richardson, Miller and Ray 1994) of the form

$$U = \frac{D - C}{1 + \exp\left[-2\left(a + b \ln d\right)\right]} + C \qquad (1)$$

where the four parameters a, b, C and D describe the dose-response behavior of a plant species to a specified herbicide, or an insect to an insecticide, and d is the deposition level.

With the formulation described by Eq (1), it is possible to take the summary results from FSCBG (the mean and standard deviation of the deposition in a spray block), combine them with a specified dose-response biological/insecticide curve, and construct a measure of spray effectiveness (Teske 1996). It is therefore critical that sufficient laboratory or field data be available to describe the above dose-response equation in any desired application. This is a project now being undertaken for herbicides by FRI and the SpraySafe Manager User Group for development of SpraySafe Manager. Existing pesticide data form the bulk of the dose-response database included here, and more specifically for the gypsy moth, for development of a dose-response function in GypsES Spray Advisor.

In the United States the USDA Forest Service will initially use the dose-response function in FSCBG and GypsES Spray Advisor. The USDA Forest Service is a cooperator in development of both decision support systems.

## 2. Database

The dose-response database is summarized in this section of the report. The specific columns in the database include the following information:

Insect/Parasite/WeedSpecies
Growth Stage
Insecticide or Herbicide
Reference #
Year
LD95
LD50
LD Information
Other Mortality Data
General Information

Entries in the dose-response database are sorted by: (1) name of the insect, parasite or weed species; (2) year of the reference; (3) name of the insecticide or herbicide applied; and (4) growth stage. The database was constructed in Paradox for Windows (version 1.0), and entry listings are subject to certain constraints imposed by that software. It is not possible to italicize or underline portions of text in a column, only the entire entry. Thus, in the Insect/Parasite/WeedSpecies column the entire entry is italicized, with the common name listed first in capital letters and the scientific name listed second, in lower case letters: for example, *ASSASSIN BUG (Acholla multispinosa).* Nomenclature is otherwise exactly as given in each reference. In some cases, only one of the two names is available. For sorting purposes, capitalized entries are sorted first, so all entries listed by common name will be alphabetized ahead of those listed by scientific name only.

Growth Stage is given as described in each reference. If a specific growth stage is not given, then the stage is listed as unknown.

Insecticides or Herbicides are listed by scientific name first, followed by commercial names, for example, Diflubenzuron (Dimilin 25WP). Insecticides and herbicides are entered exactly as described in each reference.

Reference # and Year refer to the numbered list of references found in Section 4 of this report.

LD95 and LD50 are the lethal dosages for 50 percent and 95 percent mortality, respectively. These are the two mortality data points most commonly given in dose-response literature. All mortality data are entered exactly as given in each reference, with no conversion of units. Standard abbreviations for units are used, with the exception of micrograms and microliters: $10^{-6}$ g is written as micg, and $10^{-6}$ L is written as micL. The abbreviations for liters and hectares (L and Ha) are always capitalized, even though in some references hectares is abbreviated as ha. Areas such as square cm are abbreviated as cm2. When scientific notation is used, 340000 is written, for example, as 3.4E5.

LD Information gives other mortality data available as lethal dosages: for example, LD84 denotes a lethal dosage for 84 percent mortality, LD(0) denotes a dosage for no mortality. This column also lists pertinent information about the LD values given, such as the method used to assay dose-response. In some cases the only mortality data available

may be that a species is "unaffected" or "affected" at a certain concentration of insecticide or herbicide.

Other Mortality Data lists other pertinent information about the biological response of the species to the insecticide or herbicide.

General Information gives any other important information included in the reference. No entries in this column can be italicized or underlined, so any species names given here are listed in plain type.

A list of acronyms used to describe the dose-response of the species listed in the database are summarized in Table 1. The dose-response database currently consists of 432 entries.

Table 1: Acronyms used to describe dose-response.

| | |
|---|---|
| AI | Active Ingredient |
| BIU | Billion International Units |
| Bt | *Bacillus thuringiensis* |
| CFU | Colony Forming Units |
| DAA | Days After Application |
| EC | Effective Concentration: EC50 is that concentration expected to cause 50 percent inhibition or reduction of growth |
| IU | International Unit |
| LC | Lethal Concentration: the concentration of a chemical in air to which exposure for a specific length of time is expected to cause death in a given percentage of a defined experimental animal population |
| LD | Lethal Dosage: the dose of a chemical calculated to cause death in a given percentage of a defined experimental animal population |
| LEL | Lowest Effective Level |
| MATC | Maximum Allowable Toxic Concentration |
| MEEC | Maximum Expected Environmental Concentration |
| MNPV | Multiple-embedded Nuclear Polyhedrosis Virus |
| NOAEL | No-Observed-Adverse-Effect-Level: effects may be produced at this dose, but they are not considered to be adverse |
| NOEC | No-Observable Effect Concentration |
| NOEL | No-Observable Effect Level |
| NPV | Nuclear Polyhedrosis Virus |
| PIB | Polyhedral Inclusive Bodies |
| RH | Relative Humidity |
| VMD | Volume Median Diameter |

## FOREST SERVICE DOSE-RESPONSE DATABASE

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *ALGAE* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Affected at 10 micg/L | | 5 month flow-through stream exposure. |
| *ASSASSIN BUG (Acholla multispinosa)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | No toxicity, 300 ppm topical exposure | No toxicity after consumption of treated host larvae | |
| *ATLANTIC SALMON* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | > 60 mg/ L | 96 hour exposure | | |
| *Acarina* | unknown | Bacillus thuringiensis (Bt): Dipel WP | *12* | 1995 | | | No toxic effects | | |
| *Aedes nigromaculatum* | unknown | Diflubenzuron: TH 6040 | *12* | 1995 | | 0.5 micg/ L | 48 hour exposure | | |
| *Apanteles fumiferanae* | 3rd instar | Bacillus thuringiensis (Bt): Thuricide 48LV | *12* | 1995 | | | 50-60% reduction in parasitoid pops, 8.4 BIU/L of Thuricide | | |
| *Apanteles fumiferanae* | 4th instar | Bacillus thuringiensis (Bt): Thuricide 48LV | *12* | 1995 | | | No reduction in parasitoid pops, 8.4 BIU/L of Thuricide | | |
| *Apanteles melanoscelus (Ratzeburg)* | unknown | Carbaryl | *1* | 1972 | | | LD50 > 0.01 < 0.05 | | Laboratory data; 24 hrs at 23-24 deg C; hymenopterous parasite, rapid knockdown (within 20 mins). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *Aphytis melinus* | unknown | Bacillus thuringiensis (Bt): Dipel 4L | *12* | 1995 | | | No increased mortality at 7 days, 18.7 L/Ha of Dipel | | |
| *Araneae* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *BACTERIA* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Unaffected at 1 and 10 micg/L | | 5 month flow-through stream exposure. |
| *BANANA* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Injury at 3.4, 6.7 and 10.1 kg/ Ha applied. | | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *BANANA FRUIT FLY (Zaprionus paravittiger)* | 1st instar | Diflubenzuron | *12* | 1995 | | 0.16 ppm | Inhibitory dose for adult emergence | | |
| *BANANA FRUIT FLY (Zaprionus paravittiger)* | 2nd instar | Diflubenzuron | *12* | 1995 | | 0.32 ppm | Inhibitory dose for adult emergence | | |
| *BANANA FRUIT FLY (Zaprionus paravittiger)* | 3rd instar | Diflubenzuron | *12* | 1995 | | 0.95 ppm | Inhibitory dose for adult emergence | | |
| *BARNACLE (Balanus eburneus)* | unknown | Diflubenzuron | *12* | 1995 | | | Lethal exposure at 1000 ppb; sublethal exp at 50 - 500 ppb | Both exposures result in accelerated molting and decreased survival | |
| *BEE (Apis cerana indica)* | 3rd instar | Diflubenzuron: Dimilin | *12* | 1995 | | 56.15 mg/ kg | Topical exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BEE (Apis cerana indica)* | 4th instar | Diflubenzuron: Dimilin | *12* | 1995 | | 49.13 mg/ kg | Topical exposure | | |
| *BEE (Apis cerana indica)* | pupae | Diflubenzuron: Dimilin | *12* | 1995 | | 22.69 mg/ kg | Topical exposure | | |
| *BEET ARMY WORM (Spodoptera exigua, Lepidoptera: Noctuidae)* | neonate larvae | ABG-6162 (1.5% thuringiensin) | 22 | 1987 | | | LD45 = 20 micg(AI)/mL | Residual bioassay (artificial diet), mortality after 7 days | |
| *BEET ARMY WORM (Spodoptera exigua, Lepidoptera: Noctuidae)* | neonate larvae | AVM | 22 | 1987 | | 0.814 micg(AI)/ mL | LD13 = 0.50 micg(AI)/mL | Residual bioassay (artificial diet), mortality after 7 days | |
| *BEET ARMY WORM (Spodoptera exigua, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel 2X | 22 | 1987 | | 196 micg/ mL | LD23 = 87.5 micg/ mL | Residual bioassay (artificial diet), mortality after 7 days | |
| *BEET ARMY WORM (Spodoptera exigua, Lepidoptera: Noctuidae)* | neonate larvae | Neem | 22 | 1987 | | 0.116 micL/ mL | LD37 = 0.02 micL/ mL | Residual bioassay (artificial diet), mortality after 7 days | |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B | 23 | 1995 | 0.62 | 0.14 | Fraction of Dipel in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B | *23* | 1995 | 0.62 | 0.14 | Fraction of Dipel in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + P-amino salycilic acid 0.05 % wt:vol diet | *23* | 1995 | 0.21 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + acetamide 0.01 % wt:vol diet | *23* | 1995 | 0.42 | 0.08 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + acetamide 0.05 % wt:vol diet | *23* | 1995 | 0.07 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + acetamide 0.10 % wt:vol diet | *23* | 1995 | 0.10 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + ammonium persulfate, 0.05 % wt:vol diet | *23* | 1995 | 0.14 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + ascorbic acid 0.05 % wt:vol diet | *23* | 1995 | 0.20 | 0.03 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + boric acid 0.01 % wt:vol diet | *23* | 1995 | 0.50 | 0.10 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + boric acid 0.05 % wt:vol diet | *23* | 1995 | 0.13 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + boric acid 0.10 % wt:vol diet | *23* | 1995 | 0.09 | 0.01 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + calcium acetate 0.05 % wt:vol diet | *23* | 1995 | 0.24 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + calcium carbonate 0.05 % wt:vol diet | *23* | 1995 | 0.19 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + calcium oxide 0.05 % wt:vol diet | *23* | 1995 | 0.20 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + calcium sulphate 0.05 % wt:vol diet | *23* | 1995 | 0.17 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + copper carbonate 0.05 % wt:vol diet | *23* | 1995 | 0.23 | 0.05 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + dimethyl sulphoxide 0.05 % wt:vol diet | *23* | 1995 | 0.22 | 0.05 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + dodecylamine 0.05 % wt:vol diet | *23* | 1995 | 0.35 | 0.06 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + l-arginine 0.01 % wt:vol diet | *23* | 1995 | 0.30 | 0.03 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + l-arginine 0.05 % wt:vol diet | *23* | 1995 | 0.17 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + l-arginine 0.10 % wt:vol diet | *23* | 1995 | 0.13 | 0.03 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + l-serine 0.05 % wt:vol diet | *23* | 1995 | 0.17 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + l-valine 0.05 % wt:vol diet | *23* | 1995 | 0.40 | 0.03 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + lauric acid 0.05 % wt:vol diet | *23* | 1995 | 0.37 | 0.05 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + magnesium chloride 0.05 % wt:vol diet | *23* | 1995 | 0.25 | 0.05 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + magnesium chloride 0.10 % wt:vol diet | *23* | 1995 | 0.14 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + magnesium sulphate 0.01 % wt:vol diet | *23* | 1995 | 0.20 | 0.07 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + magnesium sulphate 0.05 % wt:vol diet | *23* | 1995 | 0.08 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + magnesium sulphate 0.10 % wt:vol diet | *23* | 1995 | 0.10 | 0.03 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + malic acid 0.05 % wt:vol diet | *23* | 1995 | 0.12 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + picric acid 0.05 % wt:vol diet | *23* | 1995 | 0.16 | 0.05 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + potassium bicarbonate 0.05 % wt:vol diet | *23* | 1995 | 0.29 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + potassium carbonate 0.05 % wt:vol diet | *23* | 1995 | 0.17 | 0.03 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + sodium carbonate 0.05 % wt:vol diet | *23* | 1995 | 0.28 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + sodium dodecyl sulphate 0.01 % wt:vol diet | *23* | 1995 | 0.43 | 0.07 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + sodium dodecyl sulphate 0.05 % wt:vol diet | *23* | 1995 | 0.35 | 0.02 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + sodium dodecyl sulphate 0.10 % wt:vol diet | *23* | 1995 | 0.20 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + sodium thioglycollate 0.05 % wt:vol diet | *23* | 1995 | 0.13 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + sorbic acid 0.05 % wt:vol diet | *23* | 1995 | 0.30 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + tannic acid 0.05 % wt:vol diet | *23* | 1995 | 0.11 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + trypsin inhibitor 0.05 % wt:vol diet | *23* | 1995 | 0.15 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + tween 60, 0.05 % wt:vol diet | 23 | 1995 | 0.24 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + tween 80, 0.05 % wt:vol diet | 23 | 1995 | 0.57 | 0.23 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B + zinc sulphate 0.05 % wt:vol diet | 23 | 1995 | 0.20 | 0.04 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel 64B+ammonium phosphate dibasic 0.05 % wt:vol diet | 23 | 1995 | 0.19 | 0.05 | Fraction of compound in the diet | | Laboratory data, mortality recorded after 7 days; 20 deg. C, 65-80% RH. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 3rd instar | Bacillus thuringiensis (Bt): Dipel ES + Calcium carbonate 0.05 % wt:vol diet | 23 | 1995 | | | Toxicity relative to Dipel ES alone = 10.1(LD50), 7.2(LD95) | | Greenhouse data, feeding on canola plants for 10 days. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 3rd instar | Bacillus thuringiensis (Bt): Dipel ES + Calcium sulphate 0.05 % wt:vol diet | *23* | 1995 | | | Toxicity relative to Dipel ES alone = 2.0(LD50), 2.6(LD95) | | Greenhouse data, feeding on canola plants for 10 days. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 3rd instar | Bacillus thuringiensis (Bt): Dipel ES + Magnesium sulphate 0.05 % wt:vol diet | *23* | 1995 | | | Toxicity relative to Dipel ES alone = 2.8(LD50), 2.6(LD95) | | Greenhouse data, feeding on canola plants for 10 days. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 3rd instar | Bacillus thuringiensis (Bt): Dipel ES + Potassium carbonate 0.05 % wt:vol diet | *23* | 1995 | | | Toxicity relative to Dipel ES alone = 4.1(LD50), 3.1(LD95) | | Greenhouse data, feeding on canola plants for 10 days. |
| *BERTHA ARMYWORM (Mamestra configurata, Lepidoptera: Noctuidae)* | 3rd instar | Bacillus thuringiensis (Bt): Dipel ES + Sodium carbonate 0.05 % wt:vol diet | *23* | 1995 | | | Toxicity relative to Dipel ES alone = 5.6(LD50), 7.6(LD95) | | Greenhouse data, feeding on canola plants for 10 days. |
| *BIGEYED BUG* | unknown | Bacillus thuringiensis (Bt): Dipel WP | *12* | 1995 | | | No toxic effects | | Label application rates of Dipel. |
| *BIRDS* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | 178 ppm | Acute oral dose, NOEL = 1ppm | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BLACK FLIES* | unknown | Bacillus thuringiensis (Bt): Thuricide 32LV | *12* | 1995 | | | Two types "clearly affected", 430 IU/ mL | | Simulium vittatum and Prosimulium fascum/mixtum affected. |
| *BLUEGILL SUNFISH* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | 95 mg/ L | 96 hour exposure | No effects, 30 days at 100x MEEC for label rates of Dipel. | |
| *BLUEGILL SUNFISH* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 660 mg/ L | 96 hour exposure | | |
| *BOBWHITE QUAIL* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | >10000 g/ kg | | | |
| *BOBWHITE QUAIL* | unknown | Diflubenzuron | *12* | 1995 | | > 4640 mg/ kg | 8-day dietary concentration | | |
| *BOBWHITE QUAIL* | unknown | Diflubenzuron | *12* | 1995 | | > 5000 mg/ kg | Acute oral dose | | |
| *BOLL WEEVIL PARASITE (Trichogramma sp.)* | unknown | Diflubenzuron | *12* | 1995 | | | Unaffected if no crop oil, 46.7 L/ Ha applied. | | |
| *BRACHONID WASP (Macrocentrus ancylivorous)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | No toxicity, 300 ppm topical exposure | Reduced emergence after consumption of treated host larvae | |
| *BRINE SHRIMP (Artemisia salina)* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | 85 mg/ L | Acute static exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *BRINE SHRIMP (Artemisia salina)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Reduced lifespan at 2 ppb, no effect at 1 ppb | | |
| *BROOK TROUT* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | > 50 mg/ L | 96 hour exposure | | |
| *Brachymeria intermedia (Nees)* | unknown | Carbaryl | *1* | 1972 | | | LD50 > 0.01 < 0.05 | | Laboratory data; 24 hrs at 23-24 deg C; hymenopterous parasite, rapid knockdown (within 20 mins) |
| *CADDISFLIES* | unknown | Bacillus thuringiensis (Bt): Dipel 64AF | *12* | 1995 | | | No toxicity, 10x label application rate for Dipel | Also no toxicity, max conc of 600 IU per ml in flow-thru bioassay, Dipel 8AF | |
| *CADDISFLY* | larvae | Diflubenzuron: Dimilin W-25 | *12* | 1995 | | | Affected at 1 and 10 mg/ L | | Outdoor experimental stream exposure. |
| *CHANNEL CATFISH* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 370 mg/ L | 96 hour exposure | | |
| *CHINESE PRAYING MANTIS* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | | No effect on mortality, 150 micg/ mL diet for 15 hrs | | Praying mantis consumed cabbage looper larvae which had consumed Bt. |
| *CHIRONOMID MIDGE* | larvae | Diflubenzuron: Dimilin W-25 | *12* | 1995 | | | High mortality | | Outdoor experimental stream exposure. |
| *CINNABAR MOTH (Tyria jacobaeae)* | 4th instar | Bacillus thuringiensis (Bt): Dipel-HG | *20* | 1993 | | 0.31 mg/ mL | Bt seemed to affect feeding behavior more than mortality. | | Laboratory data, mortality recorded after 6 days; Dipel potency 4320 IU/mg; Bt has very little effect on 1st, 2nd, 3rd instars. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *CINNABAR MOTH (Tyria jacobaeae)* | 5th instar | Bacillus thuringiensis (Bt): Dipel-HG | *20* | 1993 | | 0.22 mg/ mL | Bt seemed to affect feeding behavior more than mortality. | | Laboratory data, mortality recorded after 6 days; Dipel potency 4320 IU/mg; Bt has very little effect on 1st, 2nd, 3rd instars. |
| *COCKCHAFER Melolontha* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Repellent and 100% ovicidal, 0.1% Dimilin | Dimilin applied to leaves of beech or sorrel | |
| *COLEOPTERA* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Unaffected at 1 and 10 micg/ L | | 5 month flow-through stream exposure. |
| *COLORADO POTATO BEETLE* | unknown | Diflubenzuron | *12* | 1995 | | | Unaffected, 50 mg/L; slightly, 100 mg/L; strongly, 300-500 | Foliage treatments | |
| *CONVERGENT LADY BEETLE* | unknown | Bacillus thuringiensis (Bt): Dipel 4L | *12* | 1995 | | | 13.4% increased mortality at 7 days, 18.7 L/ Ha of Dipel | | |
| *CORN* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Tolerates up to 10.1 kg/ Ha applied, up to 82 DAA | At 3.4 kg/ Ha, yield is reduced to appx 80% of control level | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel | *24* | 1986 | | 6.06E3 IU/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days. |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E3 PIB/ mL diet | *24* | 1986 | | 6.93E3 IU/ mL | Artificial diet | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E4 PIB/ mL diet | *24* | 1986 | | 6.23E3 IU/ mL | Artificial diet | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E5 PIB/ mL diet | *24* | 1986 | | 5.89E3 IU/ mL | Artificial diet | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 100 PIB/ mL diet | *24* | 1986 | | 6.73E3 IU/ mL | Artificial diet | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 2.5E3 PIB/ mL diet | *24* | 1986 | | 6.92E3 IU/ mL | Artificial diet | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 5.0E3 PIB/ mL diet | *24* | 1986 | | 5.99E3 IU/ mL | Artificial diet | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) | *24* | 1986 | | 1.55E3 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 0.1 IU/ mL diet | *24* | 1986 | | 1.00E3 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 1.0 IU/ mL diet | *24* | 1986 | | 7.17E3 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 10 IU/ mL diet | *24* | 1986 | | 5.19E4 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 100 IU/ mL diet | *24* | 1986 | | 3.21E5 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 1000 IU/ mL diet | *24* | 1986 | | 2.42E7 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *CORN EARWORM (Heliothis zea, Lepidoptera: Noctuidae)* | larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 500 IU/ mL diet | *24* | 1986 | | 1.83E6 PIB/ mL | Artificial diet | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *COTTON (Gossypium hirsutum)* | unknown | Triclopyr: Garlon | *40* | 1991 | | | 0.03 kg/ Ha lowers crop yield | 0.06 kg/ Ha causes visible damage if applied in pin-head square stage | |
| *COTTON LEAFWORM (Spodoptera littoralis)* | larvae | Diflubenzuron | *12* | 1995 | | 1 mg/kg | Dietary exposure; also = 380 micg/ larva | | |
| *COTTON LEAFWORM (Spodoptera littoralis)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Suppressed oviposition, high ovicide, 0.5 kg/feddan | | |
| *CRAB* | larvae | Diflubenzuron: Dimilin | *12* | 1995 | | | Inhibition of larval cuticle formation at 1-10 ppb | | |
| *CUTTHROAT TROUT* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | > 50 mg/ L | 96 hour exposure | | |
| *Calloprys sheridani (Lepidoptera)* | unknown | Bacillus thuringiensis (Bt) | *30* | 1995 | | 300 CFU/ mm2 | LD85 = 700 CFU/ mm2 | LD data given in CFU per mm2 of foliage | |
| *Chironomidae trichoptera* | unknown | Bacillus thuringiensis (Bt): Thuricide 32LV | *12* | 1995 | | | No toxicity, 430 IU/ mL | | |
| *Chironomus plumosus* | 4th instar larvae | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 0.56 mg/ L (EC50) | 48 hour exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *Coleoptera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *Culex quinquefascia-tus* | larvae | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Control for 14 to 35 days at 0.125 ppm in waste lagoon | | |
| *Culex quinquefascia-tus* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Satisfactory control for 1-2 wks in waste lagoon@ 112 gal/Ha | | |
| *Culex restuans* | larvae | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Control for 14 to 35 days at 0.125 ppm in waste lagoon | | |
| *Culex salinarius* | larvae | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Control for 14 to 35 days at 0.125 ppm in waste lagoon | | |
| *DAMSEL BUG* | unknown | Bacillus thuringiensis (Bt): Dipel WP | *12* | 1995 | | | No toxic effects | | Label application rates of Dipel. |
| *DESERT LOCUST (Schistocerca gregaria)* | 2nd instar | Diflubenzuron | *12* | 1995 | | 886.7 micg(AI) | Dietary exposure | | |
| *DESERT LOCUST (Schistocerca gregaria)* | 4th instar | Diflubenzuron | *12* | 1995 | | 207.4 micg(AI) | Dietary exposure | | |
| *DESERT LOCUST (Schistocerca gregaria)* | 5th instar | Diflubenzuron | *12* | 1995 | | 325.2 micg(AI) | Dietary exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *DESERT LOCUST (Schistocerca gregaria)* | unknown | Diflubenzuron | *12* | 1995 | | | LD100 = 64 g(AI)/ Ha; LD(0) = 22.5 g(AI)/ Ha | Application mortality | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Azinphosmethyl (Guthion 3 F) | *21* | 1993 | | 0.214 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50= 0.004 mg(AI)/mL | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Azinphosmethyl (Guthion 3 F) | *21* | 1993 | | 0.457 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Bacillus thuringiensis (Bt): Dipel 2X | *21* | 1993 | | 0.014 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50 >100 mg(AI)/mL | Bt did not kill all moth larvae except at 100 mg(AI)/mL; very low mortality from direct dip (must be ingested). |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Bacillus thuringiensis (Bt): Dipel 2X | *21* | 1993 | | >100 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | Caused very low mortality. |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Chlorothalonil (Bravo 720) | *21* | 1993 | | >100 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50= 9.733 mg(AI)/mL | Caused very low mortality. |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Chlorothalonil (Bravo 720) | *21* | 1993 | | >100 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | Caused very low mortality. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Cypermethrin (Ammo 2.5 EC) | *21* | 1993 | | 0.265 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50= 0.082 mg(AI)/mL | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Cypermethrin (Ammo 2.5 EC) | *21* | 1993 | | 1.006 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Esfenvalerate (Asana XL 0.66 EC) | *21* | 1993 | | 0.195 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50= 0.116 mg(AI)/mL | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Esfenvalerate (Asana XL 0.66 EC) | *21* | 1993 | | 0.0515 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Methomyl (Lannate 1.8 L) | *21* | 1993 | | 1.726 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50= 8.275 mg(AI)/mL | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Methomyl (Lannate 1.8 L) | *21* | 1993 | | 3.890 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | |
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | 3rd instar | Permethrin (Ambush 2 EC) | *21* | 1993 | | 0.135 mg(AI)/ mL | Leaf dip bioassay, larval mortality after 48 hours | Direct dip bioassay LD50= 0.005 mg(AI)/mL | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *DIAMONDBACK MOTH (Lepidoptera: Plutellidae)* | adult | Permethrin (Ambush 2 EC) | *21* | 1993 | | 0.306 mg(AI)/ mL | Residual bioassay, mortality after 24 hours | | |
| *DOGS* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | | No toxicity after acute oral dose of 10,000 mg/ kg | | |
| *DRAGON FLY (Orthemis spp., Pantala sp.)* | nymph | Diflubenzuron: TH 6040 | *12* | 1995 | | 50 micg/ L | | Exposure for 168 hours | |
| *DUCKWEED (Lemma gibba G3)* | unknown | Diflubenzuron | *12* | 1995 | | | NOEC = 190 micg/ L after 14 days exposure | | |
| *Daphnia magna* | unknown | Diflubenzuron | *12* | 1995 | | 0.0071 mg/ L (EC50) | 48 hour exposure; NOEC = 0.00045 mg/ L | | |
| *Daphnia magna* | unknown | Diflubenzuron | *12* | 1995 | | 0.068 mg/ L (EC50) | 24 hour exposure | | |
| *Daphnia magna* | 1st instar | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 0.015 mg/ L (EC50) | 48 hour exposure | | |
| *Daphnia magna* | adult | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 2.34E-4 mg/ L | 48 hour exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *Daphnia magna* | neonate | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 7.5E-4 mg/ L | 48 hour exposure | | |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Azinphosmethyl (Guthion 3 F) | *21* | 1993 | | 0.645 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 < 0.01 mg(AI)/ mL | Highly toxic over time. |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Bacillus thuringiensis (Bt): Dipel 2X | *21* | 1993 | | >100 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 > 100 mg(AI)/ mL | Caused very low mortality. |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Chlorothalonil (Bravo 720) | *21* | 1993 | | >100 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 > 100 mg(AI)/ mL | Caused very low mortality. |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Cypermethrin (Ammo 2.5 EC) | *21* | 1993 | | 0.076 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 < 0.01 mg(AI)/ mL | Highly toxic over time. |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Esfenvalerate (Asana XL 0.66 EC) | *21* | 1993 | | < 0.01 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 < 0.01 mg(AI)/ mL | Highly toxic over time. |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Methomyl (Lannate 1.8 L) | *21* | 1993 | | 4.324 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 = 0.173 mg(AI)/ mL | |
| *Diadegma insulare (Hymenoptera: Ichneumonidae)* | adult | Permethrin (Ambush 2 EC) | *21* | 1993 | | 0.490 mg(AI)/ mL | Residual bioassay, mortality after 30 minutes | Mortality after 24 hours: LD50 < 0.01 mg(AI)/ mL | Highly toxic over time. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *EARTHWORM (Eisenia fetida)* | unknown | Diflubenzuron | *12* | 1995 | | | Soil exposure, NOEL = 780 mg/ kg dry soil | | |
| *EARTHWORM (Eisenia fetida)* | unknown | Diflubenzuron: Dimilin WP-25 | *12* | 1995 | | | Soil exposure, NOEL = 1 g Dimilin/ kg dry soil | | |
| *EEL* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | | No effects, 30 days at 100x MEEC for label rates of Dipel. | |
| *EUROPEAN EARWIG (Forficularia auricularia)* | unknown | Diflubenzuron | *12* | 1995 | | | Growth, mobility affected at 12.5 g(AI)/ Ha | | |
| *EUROPEAN RED and RUST MITES* | unknown | Diflubenzuron | *12* | 1995 | | | No pop increases, 187 ppm spray to apple orchards | | |
| *Exorista rossica (Mesnil)* | unknown | Carbaryl | *1* | 1972 | | | LD50 >> 1.0 micg/ fly | | Laboratory data; 24 hrs at 23-24 deg C; dipterous parasite |
| *FALL WEBWORM (Hyphantria cunea, Lepidoptera: Arctiidae)* | 1st instar | Bacillus thuringiensis (Bt): Cry1A(a) | *27* | 1993 | | 0.1 micg/ cm2 | Artificial diet | | Laboratory data, larval mortality recorded daily for 7 days. |
| *FATHEAD MINNOW* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 430 mg/ L | 96 hour exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *FIDDLER CRAB (Uca pugilator)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | NOEC = 2 micg/ L (survival) | NOEC = 20 micg /L (molting); NOEC = 0.2 micg/ L (behavioral) | Acute exposure. |
| *FISH* | unknown | Diflubenzuron | *12* | 1995 | | | No toxicity, 40 g(AI)/ Ha application | | |
| *FOREST TENT CATERPILLAR (Malacosoma disstria)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Total control, 70 g(AI)/ Ha application | | |
| *FRESHWATER CLAM (Anodonta cygnea)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Affects lamellar calcification at 200 mg/ L | | |
| *FUNGI* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Affected at 10 micg/ L | | 5 month flow-through stream exposure. |
| *GASTROPODS* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Unaffected at 1 and 10 micg /L | | 5 month flow-through stream exposure. |
| *GERMAN COCKROACH (Blatella germanica)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | LD(0)= 4; LD15= 20; LD88= 100; LD100= 500 mg/kg | Dietary exposure | |
| *GERMAN COCKROACH (Blatella germanica)* | unknown | Diflubenzuron: Dimilin 25W | *12* | 1995 | | | LD67= 30; LD93= 60; LD98= 120 mg/m2 | Also high first instar mortality | Contact with spray of treated cage plywood panels. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GRASS SHRIMP (Palaemonetes pugio)* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxicity, 100x MEEC for 30 days | | Dipel applied in diet and water. |
| *GRASS SHRIMP (Palaemonetes pugio)* | premolt animals | Diflubenzuron | *12* | 1995 | | 1.11 micg/ L | 24 hour exposure | | |
| *GRASS SHRIMP (Palaemonetes pugio)* | unknown | Diflubenzuron: Dimilin (technical) | *12* | 1995 | | 2.95 micg/ L | 72 hour exposure | LD50 = 1.84 micg/ L after 96 hours | |
| *GRASS SHRIMP (Palaemonetes pugio)* | unknown | Diflubenzuron: Dimilin WP-25 | *12* | 1995 | | 2.83 micg/ L | 72 hour exposure | LD50 = 1.39 micg/ L after 96 hours | |
| *GRASSHOPPER* | unknown | Diflubenzuron | *12* | 1995 | | | LD100 = 64; LD(0)= 22.5 g(AI)/Ha | Application mortality | |
| *GREEN LACEWIG* | unknown | Bacillus thuringiensis (Bt): Dipel 4L | *12* | 1995 | | | 5.3% increased mortality at 7 days, 18.7 L/ Ha of Dipel | | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *5* | 1973 | | 2.4E5 PIB/ mL | | Larval source Pennsylvania | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *5* | 1973 | | 4.5E3 PIB/ mL | | Larval source Massachusetts | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *5* | 1973 | | 473 PIB/ insect | | | Larval source New Jersey |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *5* | 1973 | | 5.8E5 PIB/ mL | | | Larval source Connecticut |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *5* | 1973 | | 6.5E3 PIB/ mL | | | Larval source Michigan |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *5* | 1973 | | 8.3E4 PIB/ mL | | | Larval source New Jersey |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *8* | 1973 | | 3000 PIB/ insect | | | Larval source Yugoslavia |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Japan | *5* | 1973 | | 4.3E6 PIB/ mL | | | Larval source Michigan |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus USSR | *5* | 1973 | | 2.0E5 PIB/ mL | | | Larval source New Jersey |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus USSR | *8* | 1973 | | 5100 PIB/ insect | | | Larval source Yugoslavia |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Yugoslavia | *5* | 1973 | | 3.5E7 PIB/ mL | | Larval source Michigan | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Yugoslavia | *8* | 1973 | | 3200 PIB/ insect | | Larval source Serbia | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Yugoslavia | *8* | 1973 | | 3700 PIB/ insect | | Larval source Croatia | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Yugoslavia | *8* | 1973 | | 4600 PIB/ insect | | Larval source Slovenia | |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Dipel HG | *11* | 1978 | | 95.3 IU/ mL | Dietary exposure | | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source of virus Hamden Standard | *10* | 1981 | | 6.8E3 PIB/ mL | Dietary exposure | Larval source Pennsylvania, avg larval weight 6.0 mg | |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar | NPV: source of virus Hamden Standard | *10* | 1981 | | 3.8E4 PIB/ mL | Dietary exposure | Larval source Pennsylvania, avg larval weight 26.2 mg | |
| *GYPSY MOTH (Lymantria dispar)* | 4th instar | NPV: source of virus Hamden Standard | *10* | 1981 | | 2.8E5 PIB/ mL | Dietary exposure | Larval source Pennsylvania, avg larval weight 200.8 mg | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | 4th instar | NPV: source of virus Hamden Standard | *10* | 1981 | | 8.6E4 PIB/ mL | Dietary exposure | Larval source Pennsylvania, avg larval weight 101.0 mg | |
| *GYPSY MOTH (Lymantria dispar)* | 1st instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 930 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 5th instar; insects maintained at 29 deg C, 50% RH, 14 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 1670 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 4th instar; insects maintained at 29 deg C, 50% RH, 21 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 1750 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 5th instar; insects maintained at 29 deg C, 50% RH, 14 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 2410 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 3rd instar; insects maintained at 29 deg C, 50% RH, 21 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 3010 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 2nd instar; insects maintained at 29 deg C, 50% RH, 21 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 4640 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 1st instar; insects maintained at 29 deg C, 50% RH, 21 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 5560 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 5th instar; insects maintained at 29 deg C, 50% RH, 21 days. |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 2840 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 5th instar; insects maintained at 29 deg C, 50% RH, 14 days. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | 4th instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 21730 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 5th instar; insects maintained at 29 deg C, 50% RH, 14 days. |
| *GYPSY MOTH (Lymantria dispar)* | 5th instar | NPV: source virus Hamden, CT isolate LDP-67 | *17* | 1986 | | 103620 PIB/ mL | | | Laboratory data, NPV inoculum obtained from 5th instar; insects maintained at 29 deg C, 50% RH, 14 days. |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | Bacillus thuringiensis (Bt): Thuricide 64LV , equivalent conc. 12 BIU/ ac | *18* | 1988 | 38 IU/ cm2 | 5 IU/ cm2 | Avg over range of droplet size categories | Represents aerial spraying | Laboratory data, larvae reared from NJ strain egg masses; Bt applied to red oak leaflets, leaf and single larva incubated at 27 deg C. |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Dimilin 25-WP | *14* | 1988 | | | 100% lethal to larvae at 0.1 mg/kg diet | | |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar (early) | Bacillus thuringiensis (Bt): Dipel 64AF, Diluted @ 30 BIU/ Ha dosage | *3* | 1991 | | | | Avg. mortality 40% (from 20 to 44%, 1987, 44 to 55%, 1988) on sprayed foliage, <10% on unsprayed; significantly affected by canopy position | Field data, Ontario, Canada; ridgetop forests with mostly red oak and red maple, 15-20 m high; Bt applied aerially by fixed-wing a/c, Micronair AU4000 atomizers (55, 35 deg), 1987 and 1988. Mortality of diluted, undiluted sprays are appx the same. |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar (early) | Bacillus thuringiensis (Bt): Dipel 64AF, Undiluted @ 15 BIU/ Ha dosage | *3* | 1991 | | | | Avg. mortality 30% (from 25 to 33%) on sprayed foliage, <10% on unsprayed; significantly affected by canopy position | Field data, Ontario, Canada; ridgetop forests with mostly red oak and red maple, 15-20 m high; Bt applied aerially by fixed-wing a/c, Micronair AU4000 atomizers (35 deg), 1988. |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar (early) | Bacillus thuringiensis (Bt): Dipel 64AF, Undiluted @ 30 BIU/ Ha dosage | *3* | 1991 | | | | Avg. mortality 38% (from 20 to 55%) on sprayed foliage, <10% on unsprayed; significantly affected by canopy position | Field data, Ontario, Canada; ridgetop forests with mostly red oak and red maple, 15-20 m high; Bt applied aerially by fixed-wing a/c, Micronair AU4000 atomizers (35 deg), 1987 and 1988. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Dipel 8AF, Diluted @ 50 BIU/ Ha dosage | *4* | 1991 | | | | 56% population control achieved as measured by egg mass density (avg of two treatments) | Field data, Martinsburg, WV; mixed oak stand; egg mass densities 1480 to 4940 egg masses/ Ha pre-spray; Bt sprayed from fixed-wing a/c, flat fan nozzles (8004 and 8008) and Micronair AU5000 atomizers. No detectable differences among treatments. |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Dipel 8AF, Undiluted @ 50 BIU/ Ha dosage | *4* | 1991 | | | | 67% population control achieved as measured by egg mass density | Field data, Martinsburg, WV; mixed oak stand; egg mass densities 1480 to 4940 egg masses/ Ha pre-spray; Bt sprayed from fixed-wing a/c, flat fan nozzles (8004 and 8008) and Micronair AU5000 atomizers. No detectable differences among treatments. |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Dipel 8AF, Diluted @ 30 BIU/ Ha dosage | *15* | 1993 | | | | 99% population control as measured by egg-mass density | Field data, Geo. Washington Natl. Forest, VA; dense oak wooded area; Bt applied with fixed-wing a/c, Micronair AU5000 atomizers. |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Dipel 8AF, Undiluted @ 30 BIU/ Ha dosage | *15* | 1993 | | | | 95% population control as measured by egg-mass density | Field data, Geo. Washington Natl. Forest, VA; dense oak wooded area; Bt applied with fixed-wing a/c, Micronair AU5000 atomizers. |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Dipel 8AF, Undiluted @ 60 BIU/ Ha dosage | *15* | 1993 | | | | 96% population control as measured by egg-mass density | Field data, Geo. Washington Natl. Forest, VA; dense oak wooded area; Bt applied with fixed-wing a/c, Micronair AU5000 atomizers. |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Dipel 8AF, Undiluted @ 90 BIU/ Ha dosage | *15* | 1993 | | | | 89% population control as measured by egg-mass density | Field data, Geo. Washington Natl. Forest, VA; dense oak wooded area; Bt applied with fixed-wing a/c, Micronair AU5000 atomizers. |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar | Bacillus thuringiensis (Bt): Foray 48B | *16* | 1993 | 21.1 IU/ larva | 2.7 IU/ larva | Dietary exposure, slope =1.8 | | New Jersey strain of larvae tested. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | unknown | Bacillus thuringiensis (Bt): Thuricide 16B | *16* | 1993 | | 101.9 IU/ mL | Dietary exposure | | |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Dimilin | *13* | 1993 | | 0.06 ppm | Topical exposure, Alder; ppm in diet | | |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Dimilin | *13* | 1993 | | 0.45 ppm | Topical exposure, Douglas Fir; ppm in diet | | |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Dimilin | *13* | 1993 | | 3.58 mg/ kg | Topical exposure, Alder | | |
| *GYPSY MOTH (Lymantria dispar)* | unknown | Dimilin | *13* | 1993 | | 8.96 mg/ kg | Topical exposure, Douglas Fir | | |
| *GYPSY MOTH (Lymantria dispar)* | unknown | HD-1 strain | *12* | 1995 | | 34 IU/mL | Dietary exposure | | |
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | Diflubenzuron: Dimilin | *19* | 1996 | | | LD58 = 0.453E-6; LD68 = 0.906E-6; LD73 = 1.530E-6 mg/ m2 | LD84= 2.492E-6; LD87= 5.354E-6; LD90 = 8.414E-6; LD96 = 16.82E-6 mg/ m2 | |
| *GYPSY MOTH (Lymantria dispar)* | 3rd instar | Diflubenzuron: Dimilin | *19* | 1996 | | | LD66 = 0.906E-6; LD79 = 2.72E-6; LD87 = 1.81E-6 mg/m2 | LD89 = 4.57E-6; LD92 = 9.06E-6; LD93 = 15.29E-6 mg/ m2 | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Lymantria dispar)* | 2nd instar | NPV: Gypchek | *19* | 1996 | | 1.29E-3 mg/ m2 | LD40 = 0.382E-3; LD54 = 1.145E-3; LD65 = 3.865E-3 mg/ m2 | LD70 = 6.441E-3; LD78 = 1.908E-3 mg/ m2 | |
| *GYPSY MOTH (Porthetria dispar)* | 1st instar | NPV: source of virus Connecticut | *6* | 1967 | 5.5 PIB/ mm2 | 0.23 PIB/ mm2 | LD90 = 2.3; LD70= 0.95 PIB/mm2 | Larval source CT; curves generated | |
| *GYPSY MOTH (Porthetria dispar)* | 2nd instar | NPV: source of virus Connecticut | *6* | 1967 | 60 PIB/ mm2 | 2.3 PIB/ mm2 | LD90 = 28; LD70= 70 PIB/mm2 | Larval source CT; curves generated | |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar | NPV: source of virus Connecticut | *6* | 1967 | 100 PIB/ mm2 | 2.5 PIB/ mm2 | LD90 = 50; LD70 = 92 PIB/mm2 | Larval source CT; curves generated | |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Abate | *1* | 1972 | | | LD50 >> 4.0 micg/ larva | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Accothion | *1* | 1972 | | | LD50 >> 1.0 micg/ larva | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Carbaryl | *1* | 1972 | 1.09 micg/ larva | 0.264 micg/ larva | Ratio LD(95/50) =4.1 Regression coeff=2.66 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from northern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Carbaryl | *1* | 1972 | 11.7 micg/ larva | 0.944 micg/ larva | Ratio LD(95/50) =12.4 Regression coeff=1.50 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Carbaryl + piperonyl butoxide | *1* | 1972 | 0.90 micg/ larva | 0.21 micg/ larva | Ratio LD(95/50) =4.3 Regression coeff=2.57 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ; 5:1 synergist to insecticide. |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | DDT | *1* | 1972 | | | 90% mortality after 72 hr | | Laboratory data; 72 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Diazinon | *1* | 1972 | 3.93 micg/ larva | 0.85 micg/ larva | Ratio LD(95/50) =4.6 Regression coeff=2.46 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Dieldrin | *1* | 1972 | | | 60% mortality after 72 hr | | Laboratory data; 72 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | GS-13005 | *1* | 1972 | 2.32 micg/ larva | 0.58 micg/ larva | Ratio LD(95/50) =4.0 Regression coeff=2.71 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | GS-13005+R05-8019 | *1* | 1972 | 1.65 micg/ larva | 0.354 micg/ larva | Ratio LD(95/50) =4.7 Regression coeff=2.46 | | Laboratory data; 24 hrs at 23-24 deg C.; larvae eggs from southern NJ; 5:1 synergist to insecticide. |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Malathion | *1* | 1972 | | | LD50 >> 6.0 micg/ larva | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Mobam | *1* | 1972 | 3.51 micg/ larva | 0.31 micg/ larva | Ratio LD(95/50) =11.3 Regression coeff=1.55 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Resmethrin | *1* | 1972 | 0.317 micg/ larva | 0.025 micg/ larva | Ratio LD(95/50) =12.7 Regression coeff=1.49 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Resmethrin + piperonyl butoxide | *1* | 1972 | 0.068 micg/ larva | 0.016 micg/ larva | Ratio LD(95/50) =4.3 Regression coeff=2.61 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ; 5:1 synergist to insecticide. |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | SD-8447 | *1* | 1972 | 2.75 micg/ larva | 0.71 micg/ larva | Ratio LD(95/50) =3.9 Regression coeff=2.79 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Trichlorfon | *1* | 1972 | | | LD50>> 1.0 micg/ larva | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 3rd instar (early) | Zectran | *1* | 1972 | 0.793 micg/ larva | 0.218 micg/ larva | Ratio LD(95/50) =3.6 Regression coeff=2.93 | | Laboratory data; 24 hrs at 23-24 deg C; larvae eggs from southern NJ |
| *GYPSY MOTH (Porthetria dispar)* | 1st stage larvae | Acephate: Orthene | *2* | 1973 | | 15-25 ppm | LD90 = 25-30 ppm | 1490 insects | Laboratory data; larvae fed artificial diet; 18 hrs at 25-27 deg C, 40-50% RH; mortality counts after 96 hrs. |
| *GYPSY MOTH (Porthetria dispar)* | 1st stage larvae | Aldicarb | *2* | 1973 | | 250-500 ppm | | 320 insects | Laboratory data; larvae fed artificial diet; 18 hrs at 25-27 deg C, 40-50% RH; mortality counts after 96 hrs. |
| *GYPSY MOTH (Porthetria dispar)* | 1st stage larvae | Carbofuran | *2* | 1973 | | 3-5 ppm | LD90 = 5-10 ppm | 1010 insects | Laboratory data; larvae fed artificial diet; 18 hrs at 25-27 deg C, 40-50% RH; mortality counts after 96 hrs. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *GYPSY MOTH (Porthetria dispar)* | 1st stage larvae | Disulfuton | *2* | 1973 | | 75-125 ppm | LD90 = 125-175 ppm | 90 insects | Laboratory data; larvae fed artificial diet; 18 hrs at 25-27 deg C, 40-50% RH; mortality counts after 96 hrs. |
| *GYPSY MOTH (Porthetria dispar)* | 1st stage larvae | Oxydemetonmethyl | *2* | 1973 | | 75-125 ppm | LD90 = 250-500 ppm | 240 insects | Laboratory data; larvae fed artificial diet; 18 hrs at 25-27 deg C, 40-50% RH; mortality counts after 96 hrs. |
| *GYPSY MOTH (Porthetria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *7* | 1974 | | 220 PIB/ insect | | Larval source Pennsylvania | |
| *GYPSY MOTH (Porthetria dispar)* | 2nd instar | NPV: source of virus Hamden K-rotor | *9* | 1974 | | 17300 PIB/ insect | | Larval source Italy | |
| *GYPSY MOTH (Porthetria dispar)* | 2nd instar | NPV: source of virus Yugoslavia | *9* | 1974 | | 220000 PIB/ insect | | Larval source Italy | |
| *Gammarus pseudolimnaeus* | mature scuds | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 0.030 mg/ L (EC50) | 48 hour exposure | | |
| *HARPACTICOID COPEPOD (Tigriopus californicus)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Development hindered at 1-10 micg/ L | | |
| *HEMLOCK LOOPER (Lambdina fiscellaria)* | unknown | Bacillus thuringiensis (Bt): HD-1 strain | *12* | 1995 | | 162 IU/ mL | Dietary exposure | | Dietary exposure. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *HEMLOCK LOOPER (Lambdina fiscellaria)* | larvae, adult | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | > 90% population reduction at both stages, 70 g(AI)/ Ha | | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Diflubenzuron | *25* | 1990 | | 30.0 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Dimethoate | *25* | 1990 | | 1.20E-3 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Endosulfan | *25* | 1990 | | 7.10 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Fenitrothion | *25* | 1990 | | 0.018 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Fenvalerate | *25* | 1990 | | 0.230 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Phosalone | *25* | 1990 | | 8.90 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Pirimicarb | *25* | 1990 | | 54.0 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *HONEYBEE (Apis mellifera)* | adult (foraging) | Pirimiphos-methyl | *25* | 1990 | | 0.390 micg/ insect | Contact doses | Honeybee weight = 0.1 g/ insect | |
| *HONEYBEE (Apis mellifera)* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No adverse toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *HONEYBEE (Apis mellifera)* | adult | Diflubenzuron | *12* | 1995 | | > 100 micg/ bee | Acute oral exposure | | |
| *HONEYBEE (Apis mellifera)* | adult | Diflubenzuron | *12* | 1995 | | > 100 micg/ bee | Acute topical exposure | | |
| *HONEYBEE (Apis mellifera)* | larvae | Diflubenzuron | *12* | 1995 | | > 0.0125 micg/ bee | Acute topical exposure | | |
| *HONEYBEE (Apis mellifera)* | larvae | Diflubenzuron | *12* | 1995 | | > 0.030 micg/ bee | Acute oral exposure | | |
| *HONEYBEE (Apis mellifera)* | unknown | Diflubenzuron | *12* | 1995 | | | Dietary pollen cakes with 10 ppm reduced stored sugar 50% | Dietary sugar cakes of 1 ppm Dimilin reduced sealed brood | |
| *HONEYBEE (Apis mellifera)* | 3rd instar | Diflubenzuron: Dimilin | *12* | 1995 | | 52.9 mg/ kg | Topical exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *HONEYBEE (Apis mellifera)* | 4th instar | Diflubenzuron: Dimilin | *12* | 1995 | | 45.51 mg/ kg | Topical exposure | | |
| *HONEYBEE (Apis mellifera)* | pupae | Diflubenzuron: Dimilin | *12* | 1995 | | 22.33 mg/ kg | Topical exposure | | |
| *HONEYBEE (Apis mellifera)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | > 30 micg/ bee | Topical exposure | No adverse effects at 5.9 ppm dietary exposure | |
| *HONEYBEE (Apis mellifera)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | 59 ppm in syrup + 100 ppm in water: less comb, new workers | Elimination of brood production at this exposure | |
| *HONEYBEE (Apis mellifera)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | No toxicity, 0.4 kg(AI)/ Ha applied to apple orchards | 59 ppm in syrup and 100 ppm in water eliminates brood production, less comb, less workers | |
| *HONEYBEE (Apis mellifera)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 3.7 ppm | Dietary exposure | | |
| *HONEYBEE (Apis mellifera)* | unknown | Diflubenzuron: Dimilin WP-25 | *12* | 1995 | | > 200 micg/ bee | Topical exposure | | |
| *HORN FLY (Haematobia irritans)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | No adult emergence 4wks after 0.5% spray treatmt on cattle | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *HORSESHOE CRAB (Limulus polyphemus)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Slight molt delay, 5micg/L; severe mortality, 50 micg/ L | | |
| *HOUSE FLY (Musca domestica)* | eggs | Diflubenzuron: Dimilin | *12* | 1995 | | | No effects at 10,000 ppm | | |
| *HOUSE FLY (Musca domestica)* | larvae | Diflubenzuron: Dimilin | *12* | 1995 | | | > 90% mortality at 1.25 to 10 ppm | | |
| *HOUSE FLY (Musca domestica)* | pupae | Diflubenzuron: Dimilin | *12* | 1995 | | | No effects at 10,000 ppm | | |
| *HOUSE FLY (Musca domestica)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | LEL = 12.5 ppb | Directly treated soil @ 75 g(AI)/ Ha gives 90-100 % mortality | |
| *HUMAN (Homo sapiens)* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | | No toxicity after acute oral dose of 10,000 mg/ kg | | |
| *HUMAN (Homo sapiens)* | unknown | Triclopyr: Garlon | *36* | 1995 | | | NOAEL @ 1 day = 60 mg/kg for acute exposures | Adverse effects expected at 75 mg/ kg, lethality expected at 250 mg/ kg; for long-term toxic effects, NOAEL= 0.5 mg/kg/day | Estimates to be used with caution, based on small experiments. |
| *Helicoverpa armigera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | 55 micg/mL | Dietary exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *Helicoverpa punctigera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | 70 micg/mL | Dietary exposure | | |
| *Hemiptera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *Hyalella azteca* | unknown | Diflubenzuron | *12* | 1995 | | 1.84 micg/L | 96 hour exposure | | |
| *Hydropsychidae (Trichoptera)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | LD98.1 = 0.0025; LD97.8 = 0.025; LD41 = 0.25 ppm | No adult emergence from treated tanks | Laboratory data; mortality recorded after 15 days. |
| *Hymenoptera diptera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *Incisalia fotis (Lepidoptera)* | unknown | Bacillus thuringiensis (Bt) | *30* | 1995 | 6050 CFU/ mm2 | 2800 CFU/ mm2 | LD90 = 5700 CFU/mm2 | Data given in CFU per mm2 of foliage eaten | |
| *JACK PINE BUDWORM (Choristoneura pinus, Lepidoptera: Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): HD-1 | *28* | 1989 | 5.13 micg/mL | 0.76 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *JACK PINE BUDWORM (Choristoneura pinus, Lepidoptera: Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): HD-1-S | *28* | 1989 | 15.52 micg/mL | 3.90 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *JACK PINE BUDWORM (Choristoneura pinus, Lepidoptera: Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): NRD-12 | *28* | 1989 | 3.28 micg/mL | 0.83 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *KIDNEY BEANS* | unknown | Triclopyr: Garlon | *36* | 1995 | | | Tolerate 3.4 and 6.7 kg/ Ha applied, 82 DAA | | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *LACEWING (Chrysopa oculata)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | "Considerable mortality" at 300 ppm topical exposure | No toxicity after consumption of treated host larvae | |
| *LARGE MILKWEED BUG (Oncopeltus fasciatus)* | unknown | Diflubenzuron | *12* | 1995 | | | Reproduction inhibited, topical exposure to 1 micg | | |
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Diflubenzuron | *25* | 1990 | | 6.25E-4 micg/ insect | LD90 = 22.4; LD10 = 3.3 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 72hrs. |
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Dimethoate | *25* | 1990 | | 0.520 micg/ insect | LD90= 18.2; LD10 = 17 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 72hrs. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Endosulfan | *25* | 1990 | | 0.0162 micg/ insect | LD90= 2.8; LD10 =9.5 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 24hrs and checked at 48hrs. |
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Fenitrothion | *25* | 1990 | | 2.95E-3 micg/ insect | LD90= 4.4; LD10 =20.1 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 24hrs and checked at 48hrs. |
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Fenvalerate | *25* | 1990 | | 1.35E-3 micg/ insect | LD90= 2.6; LD10 =7.0 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 24hrs and checked at 48hrs. |
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Phosalone | *25* | 1990 | | 0.0272 micg/ insect | LD90= 5.3; LD10 =14.2 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 24hrs and checked at 48hrs. |
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Pirimicarb | *25* | 1990 | | 0.395 micg/ insect | LD90= 8.8; LD10 =18.2 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 24hrs and checked at 48hrs. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *LARGE WHITE BUTTERFLY (Pieris brassicae, Lepidoptera: Pieridae)* | 1st instar | Pirimiphos-methyl | *25* | 1990 | | 2.78E-3 micg/ insect | LD90= 4.3; LD10 =18.1 micg/ insect | Caterpillar weight = 0.7mg | Laboratory data, topical application to 2-day-old 1st instar larvae; technical grade insecticide used; dead and moribund insects recorded after 24hrs and checked at 48hrs. |
| *LEAF BEETLE (Gastroidea viridula)* | larvae, eggs | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | "Effective" | Dimilin applied to leaves of beech or sorrel | |
| *MALLARD DUCK* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | > 2,000 mg/ g | Acute oral dose | | |
| *MALLARD DUCK* | unknown | Diflubenzuron | *12* | 1995 | | > 4640 mg/ kg | 8-day dietary concentration | | |
| *MALLARD DUCK* | unknown | Diflubenzuron | *12* | 1995 | | > 5,000 mg/ kg | Acute oral dose | | |
| *MARINE COPEPOD (Acartia tonsa)* | 1st larval stage | Diflubenzuron: Dimilin | *12* | 1995 | | | Less than 5% hatch of viable nauplii, at 10ppb, after 24 hrs | Less than 50% hatch of viable nauplii, at 1ppb, after 12 hrs | |
| *MARINE COPEPOD (Acartia tonsa)* | adult | Diflubenzuron: Dimilin | *12* | 1995 | | | Survival or fecundity unaffected at 1000 ppb | | |
| *MARINE DIATOMS* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Unaffected at 5 mg/ L exposure | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *MAYFLY* | unknown | Bacillus thuringiensis (Bt): Dipel 64AF | *12* | 1995 | | | No toxicity, 10x label application rate for Dipel | Also no toxicity, max conc of 600 IU/mL in flow-thru bioassay, Dipel 8AF | |
| *MAYFLY* | unknown | Bacillus thuringiensis (Bt): Thuricide 32LV | *12* | 1995 | | | No toxicity, 430 IU/ mL | | |
| *MAYFLY* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Affected at 1 micg/ L | | 5 month flow-through stream exposure. |
| *MAYFLY* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Sensitive to 0.6 ppb, molting inhibited and less activity | Exposure in water and in diet | (heptagenid) |
| *MAYFLY* | nymphs | Diflubenzuron: Dimilin W-25 | *12* | 1995 | | | Affected at 1 and 10 mg/ L | | Outdoor experimental stream exposure. |
| *MAYFLY* | unknown | Diflubenzuron: TH 6040 | *12* | 1995 | | | LD90 = 10 micg/ L | Exposure for 168 hours | (Callibaetis sp.) |
| *MEXICAN BEAN BEETLE* | 3rd instar | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 3.4 ppm | Dietary exposure | | |
| *MIGRATORY GRASSHOPPER (Melanoplus sanguinipes)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 0:08 ppm | Lettuce diet | | |
| *MIGRATORY GRASSHOPPER (Melanoplus sanguinipes)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 0.1 ppm | Wheat seedling diet | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *MITE (Phytoseiid and Stigmaeid)* | unknown | Diflubenzuron | *12* | 1995 | | | No toxicity, 187 ppm spray to apple orchards | | |
| *MOUSE* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | | No toxicity | | |
| *MOUSE* | unknown | Diflubenzuron: Dimilin (technical) | *12* | 1995 | | 4640 mg/ kg | Acute oral dose | | |
| *MOUSE* | unknown | Diflubenzuron: Dimilin WP-25 | *12* | 1995 | | 10,000 mg/ kg | Acute oral dose | | |
| *MUMMICHOG (Fundulus heteroclitus)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 32.99 mg/ L | NOEL = 29.86 mg/ L, 96 hour exposure | | |
| *MUSSEL* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | | 28% mortality, acute static exposure to 400 ppm | | |
| *MYSID SHRIMP (Mysidopsis bahia)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | 1.97 micg/ L | 96 hour exposure; MATC < 0.4 micg/ L | | |
| *Megaloptera* | unknown | Bacillus thuringiensis (Bt): Thuricide 32LV | *12* | 1995 | | | No toxicity at 430 IU/ mL | | |
| *NEMATODES (Acrobeloides sp.)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | 10 day dietary exposure;adults unaffected, 94% pop reduction | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *NEMATODES (Panagrellus redivivus)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | 10 day dietary exposure;adults unaffected, 47% pop reduction | | |
| *NEMATODES (Pelodera sp.)* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | 10 day dietary exposure; adults unaffected, 5% pop reduction | | |
| *NORTHERN JOINT VETCH (Aeschynomene virginica)* | unknown | Collego (Colletotrichum gloeosporioides f. sp. aeschynomene) | *34* | 1996 | 2.0E6 spores/ mL | | Minimum lowest concentration to achieve 95% weed control | "Control" refers to destruction of green tissue; dosage is very subjective, varies year to year | Collego is a microherbicide, a fungus. Recommemded application rate is 23-50 gal/ac. |
| *Neuroptera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *OKRA* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Unaffected at 3.4 kg/ Ha, 8 DAA | | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *OLIGOCHAETES* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Unaffected at 1 and 10 micg/ L | | 5 month flow-through stream exposure. |
| *ORTHOPTERAN (Oxya japonica)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 0.06 micg/ insect | Topical exposure; LD50 also = 0.31 mg/ kg | | |
| *Orthoptera* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | No toxic effects | | After extensive lab, field studies with Dipel at labeled rates. |
| *PEACH TWIG BORER (Anarsia lineatella)* | unknown | Bacillus thuringiensis (Bt): Foray 48B (NOVO Biobit XL) | *31* | 1996 | | 3.8E-3 mL/ cm2 | LD70 = 1.8E-3 mL/ cm2; calc from gal/ac sprayed | | Aerial application, almond orchard, helicopter (nozzles) and fixed wing aircraft (rotary atomizers). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *PERLODID STONEFLY (Skwala sp.)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 57 mg/ L | 96 hour exposure | | |
| *PINE BUTTERFLY (Neophasia menapia)* | late instar pop. | Bacillus thuringiensis (Bt): Dipel wettable powder | *29* | 1974 | | | | At 0.5 lb/ac sprayed, 73% reduction in population achieved; at 1.0 lb/ac, 92% reduction. | Aerial application, helicopters with 80015 spray tips, flying at 50 mph, VMD appx. 250 microns. |
| *PINE BUTTERFLY (Neophasia menapia)* | late instar pop. | Mexacarbate: Zectran | *29* | 1974 | | | | At 0.15 lb/ac and 0.3 lb/ac sprayed, 97% reduction in population achieved. | Aerial application, helicopters with 80015 spray tips, flying at 50 mph, VMD appx. 250 microns. |
| *PINE TREES* | unknown | Triclopyr: Garlon | *41* | 1985 | | | Up to 4.5 kg/Ha can cause severe effects | Especially true in summer and during periods of high water stress | |
| *PLECOPTERA* | unknown | Diflubenzuron: Dimilin W-25 | *12* | 1995 | | | Slight pop. reduction at 0.0625 to 0.25 lb(AI)/ ac | Not necessarily attributable to application | |
| *POTATO PLANT* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Plant weight 6% less than untreated at 3.4 kg/ Ha, 436 DAA | | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *Plecoptera* | unknown | Bacillus thuringiensis (Bt): Thuricide 32LV | *12* | 1995 | | | No toxicity, 430 IU/ mL | | |
| *QUAHOG (Mercenaria mercenaria)* | unknown | Diflubenzuron | *12* | 1995 | | | Adversely affected at 100 mg/ L; NOEC > 320 micg/ L | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *RABBIT* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | >= 2.0E9 spores/ animal | | | |
| *RABBIT* | unknown | Bacillus thuringiensis (Bt): Dipel 6AF | *12* | 1995 | | > 2,000 mg/ kg | Acute dermal dose | | |
| *RABBIT* | unknown | Diflubenzuron: Dimilin WP-25 | *12* | 1995 | | 4640 mg/ kg | Acute dermal dose | | |
| *RAINBOW TROUT* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | > 10 mg/ L | 96 hour exposure, NOEL > 1,000 ppm | No effects, 30 days at 100x MEEC for label rates of Dipel. | |
| *RAINBOW TROUT* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | 240 mg/ L | 96 hour exposure | | |
| *RAT* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | >= 2.67 g/ kg | Acute oral dose | | |
| *RAT* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | >= 3.4E11 spores/ kg | Acute inoculation dose | | |
| *RAT* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | >= 4.7E11 spores/ kg | Acute oral dose | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *RAT* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | >= 8.0E11 spores/ animal | Acute inhalation dose | | |
| *RAT* | unknown | Diflubenzuron: Dimilin (technical) | *12* | 1995 | | 4640 mg/ kg | Acute oral dose | | |
| *RAT* | unknown | Diflubenzuron: Dimilin WP-25 | *12* | 1995 | | 10,000 mg/ kg | Acute oral dose | | |
| *RED-WINGED BLACK BIRD* | unknown | Diflubenzuron | *12* | 1995 | | 3763 mg/ kg | 8-day dietary concentration | | |
| *RICE (Oryza sativa)* | unknown | Triclopyr: Garlon | *38* | 1992 | | | Affected by 0.3 to 0.6 lb/ ac application rates | | |
| *RICE SWARMING CATERPILLAR (Spodoptera mauritania)* | adult | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | 60-64% sterility, 10 ppm; 100% sterility, 100 ppm | Dietary exposure | |
| *RODENTS* | unknown | Triclopyr: Garlon | *37* | 1984 | | | No grossly observable effects @ 250 mg/kg/day dietary intake | Decrease in body weight at 350 mg/kg/day dietary intake | |
| *ROVE BEETLE (Aleochara bilineata)* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | No toxicity after consumption of cabbage maggot | | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *SEEDLINGS, WOOD CLEARCUT* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Substantial inhibition @ concentrations >= 50 mg/kg soil | No seed germination apparent at 500 to 5000 mg/ kg soil | Soil exposure to seedligs from an 8-year old mixed wood clearcut, classified as Rubus species, other dicots and monocots. |
| *SHEEP* | unknown | Bacillus thuringiensis (Bt): Dipel D, Thuricide-HP | *12* | 1995 | | | No toxicity after oral diet of 500 mg/kg per day for 5 mos. | | Approximately 10E12 spores per day. |
| *SHEEP AND SWINE* | unknown | Diflubenzuron | *12* | 1995 | | | No toxicity, 100 ppm diet | | |
| *SHEEPSHEAD MINNOW* | unknown | Bacillus thuringiensis (Bt): Dipel | *12* | 1995 | | | | No effects, 30 days at 100x MEEC for label rates of Dipel. | |
| *SMALLMOUTH BASS* | adult | Diflubenzuron | *12* | 1995 | | 10-100 mg/ L | 96 hour exposure | | |
| *SMALLMOUTH BASS* | juvenile | Diflubenzuron | *12* | 1995 | | 250 mg/ L | 96 hour exposure | | |
| *SNAIL (Physa sp.)* | unknown | Diflubenzuron | *12* | 1995 | | > 125 ppm | Acute exposure | | |
| *SOYBEANS* | unknown | Imazapyr: Arsenal | *35* | 1986 | | | Inhibited growth at 6.5 g/ Ha | Imazapyr is a potent inhibitor of plant growth. | |
| *SPINED SOLDIER BUG* | unknown | Bacillus thuringiensis (Bt): Dipel WP | *12* | 1995 | | | No toxic effects | | Label application rates of Dipel. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): HD-1 | *28* | 1989 | 3.24 micg/mL | 0.49 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): HD-1-S | *28* | 1989 | 17.25 micg/mL | 2.62 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): NRD-12 | *28* | 1989 | 2.75 micg/mL | 0.62 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): SAN415 32LV (based on NRD-12) | *28* | 1989 | | 158 IU/ mL | | | Laboratory data, larval mortality recorded after 14 days. |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 4th instar (early) | Bacillus thuringiensis (Bt): Thuricide 32LV (based on HD-1) | *28* | 1989 | | 163 IU/ mL | | | Laboratory data, larval mortality recorded after 14 days. |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 2nd instar | Bacillus thuringiensis (Bt): Cry1A(a) | *27* | 1993 | | 6.0 micg/mL | Artificial diet | | Laboratory data, larval mortality recorded daily for 14 days. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | unknown | Bacillus thuringiensis (Bt): HD-1 strain | *12* | 1995 | | 63 IU/ mL | Dietary exposure | | |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | 6th instar + pupae | Bacillus thuringiensis (Bt): HD-S-1980 | *26* | 1995 | 25.6 IU/larva | 2.8 IU/larva | Force-feeding of late sixth instars and pupae | | Laboratory data, mean of nine field populations treated. |
| *SPRUCE BUDWORM (Choristoneura fumiferana,Lepidoptera Tortricidae)* | unknown | Mexacarbate: Zectran FS-15, diluted | *32* | 1995 | | | LD46 = 0.08; LD100 = 1.8 mg/m2 | Data given in mg Zectran per m2 | Aerial application, larvae on petri dishes in the field; larval mortality recorded after 24 hrs. |
| *SQUASH* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Emerges and grows normally at 3.4 kg/ Ha applied, by 82 DAA | | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *STONEFLY* | unknown | Bacillus thuringiensis (Bt): Dipel 64AF | *12* | 1995 | | | No toxicity, 10x label application rate for Dipel | | |
| *STONEFLY* | unknown | Diflubenzuron: Dimilin | *12* | 1995 | | | Affected at 1 micg/L | | 5 month flow-through stream exposure. |
| *STONEFLY* | nymph | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | | Decreased survival | Exposure in water and in diet | (Peltoperla arcuata) |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *STONEFLY (Pteronarcys californica)* | unknown | Bacillus thuringiensis (Bt) | *12* | 1995 | | 80 mg/ L | 24 hour exposure | LD50 = 10 mg/ L after 96 hours | (Pteronarcys californica) |
| *STRIPED EARWIG* | unknown | Bacillus thuringiensis (Bt): Dipel WP | *12* | 1995 | | | No mortality observed at 10x label application rate | | |
| *SUGAR BEETS* | unknown | Imazapyr: Arsenal | *35* | 1986 | | | LD100= 6.5 g/ Ha | Imazapyr is a potent inhibitor of plant growth. | |
| *TACHINID PARASITE (Doryphorphaga doryphorae)* | unknown | Diflubenzuron | *12* | 1995 | | | Unaffected at 50 mg/L 0-4% survival at 300-500 mg/L | | Treatment of potato foliage for control of Colorado potato beetle. |
| *TERRESTRIAL FUNGI (Phythium sp.)* | unknown | Diflubenzuron | *12* | 1995 | | | Inhibition of growth at 50 and 100 ppm | | |
| *TERRESTRIAL FUNGI (Fusarium sp., Trichoderma sp.)* | unknown | Diflubenzuron | *12* | 1995 | | | NOEC at 100 ppm | | |
| *TERRESTRIAL FUNGI (Rhizoctonia solani)* | unknown | Diflubenzuron | *12* | 1995 | | | Inhibition of growth at 300 ppm | | |
| *TERRESTRIAL FUNGI (Rhizopus sp., Aspergillus sp.)* | unknown | Diflubenzuron | *12* | 1995 | | | NOEC at 100 ppm | 50 and 100 ppm exposure | |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel | *24* | 1986 | | 1.55E3 IU/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E3 PIB/ mL diet | *24* | 1986 | | 2.03E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E4 PIB/ mL diet | *24* | 1986 | | 1.67E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E5 PIB/ mL diet | *24* | 1986 | | 1.46E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E6 PIB/ mL diet | *24* | 1986 | | 2.20E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 1.0E7 PIB/ mL diet | *24* | 1986 | | 1.60E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 100 PIB/ mL diet | *24* | 1986 | | 1.68E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 2.5E3 PIB/ mL diet | *24* | 1986 | | 1.82E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | Bacillus thuringiensis (Bt): Dipel + NPV, 5.0E3 PIB/ mL diet | *24* | 1986 | | 1.64E3 IU/ mL | Dietary exposure | NPV source: H. armigera, Hubner, China variant. | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | NPV: source virus H. armigera (Hubner, Chinese) | *24* | 1986 | | 3.79E3 PIB/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days. |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 0.1 IU/ mL diet | *24* | 1986 | | 6.52E2 PIB/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 1.0 IU/ mL diet | *24* | 1986 | | 8.87E3 PIB/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 10 IU/ mL diet | *24* | 1986 | | 3.02E5 PIB/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 100 IU/ mL diet | *24* | 1986 | | 1.02E7 PIB/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TOBACCO BUDWORM (Heliothis virescens, Lepidoptera: Noctuidae)* | neonate larvae | NPV: source virus H. armigera (Hubner, Chinese) + Bt: Dipel, 500 IU/ mL diet | *24* | 1986 | | 2.63E8 PIB/ mL | Dietary exposure | | Laboratory data, larval mortality recorded after 7 days; virus was multiple-embedded NPV (MNPV). |
| *TRICHOPTERA* | unknown | Diflubenzuron: Dimilin W-25 | *12* | 1995 | | | Slight pop. reduction at 0.0625 to 0.25 lb(AI)/ ac | Not necessarily attributable to application | |
| *TWO-SPOTTED SPIDER MITES* | unknown | Acaricide | *33* | 1995 | 0.300 mL/ L | 0.095 mL/ L | LD90= 0.230 mL/ L | After 48 hrs: LD05= 0.1; LD40= 0.2; LD70= 0.4; LD75=0.5; LD85= 0.6 mL/ L | Data after 72 hrs unless otherwise noted. |
| *Tanytarsus dissimilis* | unknown | Diflubenzuron | *12* | 1995 | | 1.02 micg/ L | 96 hour exposure | | |
| *WATER SCAVENGER BEETLE (Hydrophilus triangularis)* | adults | Diflubenzuron: TH 6040 | *12* | 1995 | | | No mortality, concentrations as high as 250 micg/ L | | Laccophilus spp., Thermonectus basillaris, Tropisternus lateralis. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *WATER SCAVENGER BEETLE (Hydrophilus triangularis)* | larvae | Diflubenzuron: TH 6040 | *12* | 1995 | | 100 micg/ L | 48 hour exposure | | |
| *WESTERN SPRUCE BUDWORM (Choristoneura occidentalis, Lepidoptera)* | 4th instar (early) | Bacillus thuringiensis (Bt): HD-1 | *28* | 1989 | 0.65 micg/mL | 0.06 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *WESTERN SPRUCE BUDWORM (Choristoneura occidentalis, Lepidoptera)* | 4th instar (early) | Bacillus thuringiensis (Bt): HD-1-S | *28* | 1989 | 4.52 micg/mL | 0.78 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *WESTERN SPRUCE BUDWORM (Choristoneura occidentalis, Lepidoptera)* | 4th instar (early) | Bacillus thuringiensis (Bt): NRD-12 | *28* | 1989 | 0.35 micg/mL | 0.06 micg/mL | Dietary exposure | | Laboratory data, larval mortality recorded after 14 days. |
| *WESTERN SPRUCE BUDWORM (Choristoneura occidentalis, Lepidoptera)* | 4th instar (early) | Bacillus thuringiensis (Bt): SAN415 32LV (based on NRD-12) | *28* | 1989 | | 33 IU/ mL | | | Laboratory data, larval mortality recorded after 14 days. |

| Insect/Parasite/ Weed Species | Growth Stage | Insecticide or Herbicide | Ref # | Year | LD95 | LD50 | LD Information | Other Mortality Data | General Information |
|---|---|---|---|---|---|---|---|---|---|
| *WESTERN SPRUCE BUDWORM (Choristoneura occidentalis, Lepidoptera)* | 4th instar (early) | Bacillus thuringiensis (Bt): Thuricide 32LV (based on HD-1) | *28* | 1989 | | 38 IU/ mL | | | Laboratory data, larval mortality recorded after 14 days. |
| *WESTERN SPRUCE BUDWORM (Choristoneura occidentalis, Lepidoptera)* | unknown | Bacillus thuringiensis (Bt): HD-1 strain | *12* | 1995 | | 11 IU/ mL | Dietary exposure | | |
| *WHEAT* | seedling | Triclopyr: Garlon | *36* | 1995 | | | Tolerates up to 10.1 kg/Ha applied, 8 DAA | Yield from untreated plots twice as high | Triclopyr (480 g/L, consistent with Garlon 4) applied by ground sprayer to silt loam soil before planting. |
| *WHITE-MARKED TUSSOCK MOTH* | unknown | Bacillus thuringiensis (Bt): HD-1 strain | *12* | 1995 | | 12 IU/ mL | Dietary exposure | | |
| *WHITE-MARKED TUSSOCK MOTH* | unknown | Diflubenzuron: Dimilin 25-WP | *12* | 1995 | | > 50 mg/ L | 96 hour exposure | | |

# 3. Dose-Response Functions

Of all of the entries present within the dose-response database, to date only 45 of them are detailed sufficiently so that the dose-response function, described by Eq (1), can be determined. Specifically, the assumption is made in Eq (1) that C = 0 and D = 1, implying that with no deposit, there is no control, and with large deposit, there is complete control.

Therefore, the two parameters a and b must be determined for Eq (1) to be usable as a dose-response function. This suggests that a specific chemical, acting on a biological organism, must have two data points recoverable from the literature (most generally the LD95 and the LD50). With these data in hand, the two parameters can be determined.

For consistency, all deposition units are converted to $mg/m^2$. Table 2 displays the parameters determined from the above approach. Their values form the dose-response library in FSCBG and its decision support systems.

In Table 2 the column titled "Type of Data" refers to the method used to assay insect mortality:

A Artificial diet (feeding discs, cubes or treated foliage discs in the laboratory)
B Force feeding (injection into the gut, in the laboratory)
C Contact dose (topical application in the laboratory)
D Field data (from aerial spraying)
E Spray tower data

Table 2: Summary of dose-response parameters.

| INSECTICIDE/ HERBICIDE | INSECT/ PARASITE/ WEED SPECIES | TYPE OF DATA | REF # | a | b |
|---|---|---|---|---|---|
| AVM | Beet Army Worm, neonate larvae | A | *22* | 1.977 | 1.951 |
| Carbaryl | Gypsy Moth, 3rd instar | C | *1* | -5.353 | 0.585 |
| Carbaryl + piperonyl butoxide | Gypsy Moth, 3rd instar | C | *1* | -7.739 | 1.012 |
| Diazinon | Gypsy Moth, 3rd instar | C | *1* | -8.70 | 0.962 |
| Dimethoate | White Butterfly, 1st instar | B | *25* | -12.56 | 1.081 |
| Dimilin (Diflubenzuron) | German Cockroach, unknown stage | A | *12* | -3.903 | 1.252 |
| Dimilin (Diflubenzuron) | Gypsy Moth, 2nd instar | E | *19* | 2.10 | 0.389 |
| Dimilin (Diflubenzuron) | Gypsy Moth, 3rd instar | E | *19* | 2.16 | 0.382 |
| Dimilin (Diflubenzuron) | White Butterfly, 1st instar | B | *25* | -9.29 | 1.837 |
| Dipel (Bt) wettable powder | Pine Butterfly, late instars | D | *29* | -3.701 | 1.043 |
| Dipel 2X | Beet Army Worm, neonate larvae | A | *22* | -3.348 | 0.749 |
| Dipel 6AF (Bt) | Butterfly (*I. fotis*), unknown stage | D | *30* | -0.535 | 1.025 |
| Dipel 6AF (Bt) | Butterfly (*C. sheridani*), unknown stage | D | *30* | -0.475 | 1.724 |
| Endosulfan | White Butterfly, 1st instar | B | *25* | -19.87 | 2.397 |
| Fenitrothion | White Butterfly, 1st instar | B | *25* | -21.77 | 3.281 |
| Fenvalerate | White Butterfly, 1st instar | B | *25* | -11.28 | 1.932 |
| Foray 48B (Bt) | Gypsy Moth, 3rd instar | A | *16* | -0.686 | 0.716 |
| Foray 48B (Bt) | Peach Twig Borer, building population | D | *31* | 1.556 | 0.282 |
| GS-13005 | Gypsy Moth, 3rd instar | C | *1* | -9.203 | 1.062 |
| GS-13005 + R05-8019 | Gypsy Moth, 3rd instar | C | *1* | -7.816 | 0.956 |

Table 2: Summary of dose-response parameters (continued).

| INSECTICIDE/ HERBICIDE | INSECT/ PARASITE/ WEED SPECIES | TYPE OF DATA | REF # | a | b |
|---|---|---|---|---|---|
| HD-S-1980 (Bt) | Spruce Budworm, 6th instar | B | *26* | -2.360 | 0.665 |
| HD-S-1980 (Bt) | Spruce Budworm, 4th instar | A | *28* | -2.949 | 0.782 |
| HD-S-1980 (Bt) | Jack Pine Budworm, 4th instar | A | *28* | -4.458 | 1.068 |
| HD-S-1980 (Bt) | Western Spruce Budworm, 4th instar | A | *28* | -2.147 | 0.838 |
| Mobam | Gypsy Moth, 3rd instar | C | *1* | -4.877 | 0.607 |
| Neem | Beet Army Worms, neonate larvae | A | *22* | 0.449 | 0.151 |
| NPV | Gypsy Moth, 1st instar | A | *6* | -2.231 | 1.687 |
| NPV | Gypsy Moth, 2nd instar | A | *6* | -7.538 | 1.944 |
| NPV | Gypsy Moth, 3rd instar | A | *6* | -9.498 | 2.131 |
| NPV | Gypsy Moth, 2nd instar | E | *19* | -0.393 | 0.195 |
| Phosalone | White Butterfly, 1st instar | B | *25* | -17.24 | 1.950 |
| Pirimicarb | White Butterfly, 1st instar | B | *25* | -18.77 | 1.633 |
| Pirimiphos-methyl | White Butterfly, 1st instar | B | *25* | -19.19 | 2.967 |
| Resmethrin | Gypsy Moth, 3rd instar | C | *1* | -3.20 | 0.580 |
| Resmethryn + piperonyl butoxide | Gypsy Moth, 3rd instar | C | *1* | -5.164 | 1.017 |
| SAN415 (Bt: NRD-12) | Spruce Budworm, 4th instar | A | *28* | -1.707 | 0.989 |
| SAN415 (Bt: NRD-12) | Jack Pine Budworm, 4th instar | A | *28* | -2.164 | 1.072 |
| SAN415 (Bt: NRD-12) | Western Spruce Budworm, 4th instar | A | *28* | 0.508 | 0.835 |
| SD-8447 | Gypsy Moth, 3rd instar | C | *1* | -9.641 | 1.087 |
| Thuricide 32 LV (Bt: HD-1) | Spruce Budworm, 4th instar | A | *28* | -1.067 | 0.770 |

Table 2: Summary of dose-response parameters (concluded).

| INSECTICIDE/ HERBICIDE | INSECT/ PARASITE/ WEED SPECIES | TYPE OF DATA | REF # | a | b |
|---|---|---|---|---|---|
| Thuricide 32 LV (Bt: HD-1) | Jack Pine Budworm, 4th instar | A | *28* | -1.427 | 0.771 |
| Thuricide 32 LV (Bt: HD-1) | Western Spruce Budworm, 4th instar | A | *28* | 0.426 | 0.618 |
| Thuricide 64 LV | Gypsy Moth, 2nd instar | A | *18* | -1.564 | 0.726 |
| Zectran (Mexacarbate) | Gypsy Moth, 3rd instar | A | *1* | -8.764 | 1.140 |
| Zectran FS-15 (Mexacarbate) | Spruce Budworm, unknown stage | D | *20* | 1.856 | 0.751 |

# 4. References

The references include the references describing FSCBG, SpraySafe Manager, and GypsES Spray Advisor in Section 1 of this report, and all numbered references identified in the dose-response database in Section 2 and the dose-response function table in Section 3.


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